REMARKS

In the Office Action dated July 20, 2009, Claims 1-34 were pending[1]. Claims 20 and 22-34 were withdrawn from further consideration as drawn to non-elected claims. Claims 1-19 and 21 were under examination and rejected.

This Response addresses each of the Examiner's rejections. Favorable consideration of all pending claims is therefore respectfully requested.

Claims 1-19 and 21 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by Hwang et al. (*Current Opinion in Mol. Therapeutics* 1: 471-479, 1999) (hereinafter "Hwang").

Applicants respectfully disagree.

Hwang is a review article which attempts to summarize the use of recombinant poxviruses in prostate cancer immunotherapy. The authors discuss the small advances made and certain problems observed during preliminary investigation with a number of different proposed immunotherapeutic strategies using recombinant poxviruses. The authors emphasize the observed difficulty in immunizing against self antigens and the uncertainty regarding whether the *in vitro* demonstration of an immune response, either cellular or humoral, will translate into therapeutic efficacy in prostate cancer patients. The potential advantages and disadvantages of orthopox and avipox viruses are discussed in the article. However, there is no clear indication regarding which theoretical approach will show any promise of success (beyond the preliminary result obtained with vaccinia vectors – see e.g. Fong et al., *J. Immunol* 1997, cited as Reference No. 16 in Hwang on page 472 and 474, a copy of which has been provided with Applicants' IDS dated May 24, 2006).

[1] The Examiner has incorrectly identified claims 1-19 and 21 as pending on page 1, Item 4 of the Office Action. Appropriate correction is requested for next Office Action.

Instant claim 1 and dependent claims are directed *inter alia* to a vaccine construct comprising an avipox virus vector which expresses a sequence of nucleotides encoding a xenogeneic prostate specific polypeptide or a derivative or analog.

The Examiner alleges that Hwang teaches a vaccine construct comprising an avipox virus vector encoding a prostate specific polypeptide. Further, referring to page 475, column 1, the Examiner also alleges that Hwang teaches advantages of using a xenogeneic form of a prostate specific polypeptide.

Applicants observe that there is no discussion of using a xenogeneic form of a prostate specific polypeptide on page 475 of Hwang. A discussion of a xenogeneic form of a prostate specific polypeptide is found on page 474, left column of Hwang, which references Fong et al. (1997). Contrary to the Examiner's allegation, the xenogeneic prostate specific antigen referred to by the Examiner and disclosed in Fong et al. (1997) was administered using a vaccinia virus, which is an orthopox rather than an avipox viral vector. There is no disclosure in Hwang or Fong et al. (1997) that a fowlpox vector encoding a xenogeneic prostate specific antigen would have any efficacy. Thus, Hwang fails to teach the use of an avipox vector expressing a xenogeneic prostate specific polypeptide.

Instant claim 2 is directed to a vaccine construct wherein the construct further comprises a nucleotide sequence encoding an immunostimulatory ploypeptide. The Examiner alleges that Hwang discloses (on pages 475-476) genetic vaccine constructs using co-expression of immunomodulating protein such as IL-2 with the target prostate tumor specific antigen. However, Hwang discloses co-expression only in the context of vaccinia viruses and *not* avipox viruses.

Applicants respectfully submit that apart from the differential ability of vaccinia and avipox viruses to replicate in a host, these vectors have completely different backbones, and results achieved with one vector are not necessarily representative or predictive of the results with the other.

Accordingly, it is respectfully submitted that Hwang does not teach each and every element of the claimed invention. Withdrawal of the rejection under 35 U.S.C. §102(b) based on Hwang is respectfully requested.

Claims 1-, 3-6, 11-17, 19 and 21 are rejected under 35 U.S.C. §102(e) as allegedly anticipated by McNeel et al. (US2004/01428290A1) (hereinafter "McNeel").

The Examiner alleges that McNeel teaches a genetic vaccine construct comprising an avipox virus vector encoding a xenogeneic prostate specific polypeptide. The Examiner refers to the entire publication, the abstract, and page 10, column 2, paragraphs 0087-0091. The Examiner further alleges that McNeel teaches using fowlpox virus vector expressing "the same antigenic polypeptide (prostatic acid phosphatase (PAP)) as a "boost"" at page 6, paragraph 0046.

Applicants respectfully disagree. The publication as a whole and the abstract are directed to administration of *plasmid* vectors encoding prostatic acid phosphatase, not viral vectors. At page 10, column 2 (paragraphs 0087-0091), McNeel describes immunization with *vaccinia* virus vector expressing human PAP and administration to rats. Paragraph [0046] referred to by the Examiner is set out in full:

> "**[0046]** The present invention provides DNA-based vaccines that express a protein antigen, prostatic acid phosphatase, and methods for treating prostate cancers in an animal using the vaccines. In addition to the reasons explained above, plasmid vaccines are advantageous over viral vaccines. For example, viral vaccines are not amenable to repeated immunizations. With viral vectors, one is trying to elicit an immune response against a "self" protein encoded by

> a foreign virus. The immune system preferentially recognized the foreign proteins, sometimes hundreds of proteins, encoded by the virus. The present inventor has found in rats that repeated immunizations with a vaccinia virus encoding hPAP elicits a strong vaccinia response but no hPAP-specific response. That same finding has now been shown in humans, in trial in which repeated immunization with the vaccinia virus encoding human PSA elicited weak PSA-specific immunity, but potent vaccinia virus encoding human PSA elicited weak PSA-specific immunity, but potent vaccinia immunity (Sanda et al., 1999, Urology 53:260). The direction in the field of viral-based vaccines is to "prime" with a virus encoding the antigen, and then "boost" with a different virus (like adenovirus or foul pox) encoding the same antigen. The advantage of plasmid DNA vaccines is that they encode a defined, often small, number of proteins. And therefore one can repetitively immunize the animal patient. Furthermore, a virus may kill cells, incorporate into the genome, or potentially induce other unwanted immune responses. All these are disadvantages that are likely avoided by DNA plasmid vaccines."

The passage referred to the Examiner in paragraph 0046 is as follows:

> "The direction in the field of viral based vaccines is to prime with a virus encoding the antigen and "boost" with the different virus (like adenovirus or fowlpox) encoding the same antigen."

This passage clearly relates very generally to a prior art strategy of boosting with non-vaccinia viral vectors in order to avoid anti-vector immune responses to priming with vaccinia. Applicants respectfully submit that this paragraph does not teach an avipox virus vector encoding a xenogeneic prostate specific polypeptide, as presently claimed.

Accordingly, Applicants respectfully submit that McNeel fails to teach each and every element of the claimed invention. Withdrawal of the rejection under 35 U.S.C. §102(e) based on McNeel is respectfully requested.

Claims 1-8, 11-19 and 21 are rejected under 35 U.S.C. §103(a) as allegedly unpatentable over McNeel in view of Schlom et al. (WO 01/95919) (hereinafter "Schlom").

The Examiner alleges that Schlom teaches a vaccine construct comprising an avipox virus encoding a prostate specific polypeptide and/or a gene encoding a cytokine such as GM-

CSF. The Examiner contends that the combination of Schlom and McNeel, which allegedly teaches a poxvirus vector encoding and expressing a xenogeneic prostate specific polypeptide, renders the claims obvious.

However, as submitted above, McNeel fails to teach an avipox virus vector encoding a xenogeneic prostate specific polypeptide. McNeel suggests that a *plasmid* vector encoding PAP is preferred as it overcomes the disadvantages of viral vectors including vaccinia vectors. Furthermore, previous results achieved with vaccinia vectors were achieved after xenogeneic immunization dependent upon the intravenous administration of very high levels of replicating vaccinia vector. There was no expectation in the art that xenogeneic immunization of humans using a fowlpox vector could be effective.

Moreover, Applicants submit that the disclosure of McNeel would be considered by the skilled person in the context of a common general knowledge in the art. For example, as stated in Hwang, there was considerable uncertainty regarding whether an avipox vector system could produce an appropriate response. The authors of Hwang emphasize the observed difficulty in immunizing against self antigens and uncertainty regarding whether the *in vitro* demonstration of an immune response will translate into therapeutic efficacy in prostate cancer patients.

The above fundamental deficiencies of McNeel are not cured by Schlom. Further, the person skilled in the art also would not have been motivated to combine Schlom and McNeel to attempt to arrive at the present invention. The art recognized difficulties associated with fowlpox viruses and would not have added the extra hurdle of producing a xenogeneic response by administering a xenogeneic antigen with a reasonable expectation of success. As evidenced by the prior art, administration of a xenogeneic antigen was neither a routine method to try nor

associated with any reasonable expectation of success at the relevant time. It is the present invention that provides the specific combination as claimed.

Accordingly, the present invention is not obvious in view of the combination of McNeel and Schlom. Withdrawal of the rejection under 35 U.S.C. §103(a) based on McNeel and Schlom is respectfully requested.

In view of the foregoing amendments and remarks, it is firmly believed that the subject application is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

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